	Author	Coulter and Harris (1983) citation in text of article
1	Skurnick S et al. (2010)	Fab fragments purified from the human mAb to PNAG, prepared
		using papain conjugated to agarose beads (Sigma-Aldrich) as described (40);
2	Backovic M et al. (2010)	Enzymatic digestion of antibodies with papain (and less
		often with pepsin) has traditionally been used for Fab production
		(Porter, 1958, 1959; Coulter and Harris, 1983;
		Rousseaux et al., 1983).
3	Nasseff HM et al. (2009)	Fab fragments can be directly generated using thiol proteases
		such as papain or ficin or, alternatively, F(ab')2 fragments can
		be generated using bromelain, pepsin, or ficin, and the disulfide
		hinge is subsequently cleaved using a reducing agent, generating
		Fab fragments. 9,10
4	Niwa T et al. (2009)	The concentration of the obtained F(ab)2 fragments was
		calculated based on their absorption at 280 nm, assuming an E value
		of 14 [19].
5	Silva SR et al. (2010)	To obtain Fab and Fc fragments, IgG1 samples were digested by solid phase
		papain (Sigma-Aldrich), as described by Coulter and Harris (28).
6	Kimura S et al. (2008)	Preparation of Fab fragments was performed as previously described (Coulter
		and Harris, 1983).
7	Brereton HM et al. (2005	Fab fragments were purified on a Q Sepharose HP column and eluted with a
		linear NaCl gradient (0-1 M).30
8	Gora M et al. (2004)	Rabbit IgG Fab preparations were prepared using immobilized papain (Perbio
		Science, Tattenhall, UK) followed by chromatography through protein A
		Sepharose to remove the undigested IgG and Fc fragments [27].
9	Kobayashi N et al. (2003)	The flow-through solution containing the F(ab')2 fragment was collected,
		dialysed against cold buffer A (1 day), concentrated and its protein
		concentration determined from the absorption at 280 nm assuming an E-value
		of 14 (Coulter and Harris, 1983).
10	Mukherjee M et al. (2002)	Anti-78 kDa Fab fragments were prepared as described by Coulter and Harris (1983).
11	Luo QZ et al. (2002)	Therefore the optimal incubation time for cleavage of IgG with immobilized
11	Euo QZ er ur. (2002)	papain is much longer than that with free papain, which was consistent with
		the result obtained by Coulter et al. [27].
12	Kobayashi N et al. (2000)	The flow-through solution containing the F(ab')2 fragment was collected, and
	Treesty tions 11 er um (2000)	its protein concentration determined from the absorption at 280 nm assuming
		an E-value of 14 (Coulter and Harris, 1983).
13	Mullock BM et al. (2000)	Monovalent Fab fragments of rabbit anti-Syn7#2 IgG were prepared
	1.14110411 2311 41 411 (2000)	according to Coulter and Harris (1983) and then affinity purified like the
		intact antibodies.
14	Gomez HF et al. (1999)	The IgG was purified using a modification of the method described by
		Goding ²⁴ and Coulter et al. ²⁵
15	Clement S et al. (1999)	Fab fragments were prepared by a slight modification of the
		method of Coulter and Harris. 21
16	Almeida SR et al. (1998)	The product was passed once through a protein-A-Sepharose column. F(ab)
		fragments were obtained in the void volume, whereas intact IgG and Fc
		fragments were retained in the column [18].
17	Sinha D et al. (1998)	To obtain Fab fragments, the antibodies were cleaved with papain (Coulter
		and Harris, 1983) and passed over a protein A column to remove the Fc
		fragments and any undigested IgG.
18	Ng PC et al. (1997)	The protein concentration of IgG, F(ab')2, and Fab was determined
	" ' ' ' '	from the absorbance at 280 nm with a Beckman DU640 spectrophotometer
		(Beckman Instruments, Inc., Fullerton, California USA) using the extinction
		coefficient of 1.4 (cm • mg/ml). 15
19	Koyama H et al. (1996)	Fab fragments of monoclonal antibodies against a2 integrin receptor were

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References with Coulter et al. (1983) citations

		Harris, 1983).
20	Wong GK et al. (1996)	Protein concentrations were estimated by measuring OD ₂₈₀ using an
		extinction coefficient of 1.44 (Mandy and Nisonoff, 1963; Coulter and Harris,
		1983) for both whole antibody and Fab fragments.
21	Balthasar JP et al. (1996)	Anti-MTX Fab fragments were prepared and purified from anti-MTX IgG
	` '	following the procedure of Coulter and Harris, with slight modification. ²¹
22	Krop I et al. (1996)	Fab rabbit anti-mouse p was prepared from purified IgC (Jackson
22	Mopresus (1990)	ImmunoResearch Laboratories) using immobilized papain (Pierce, Rockford,
		IL) (44), and biotinylated with NHS (N-hydroxysuccinimide)-biotin (Zymed,
		San Francisco, CA). LFA-1 Ab I21/7 (rat IgG2a) was obtained from Life
		Technologies.
23	Kolodiej SJ et al. (1996)	Fab fragments were prepared by digestion with papain essentially as
23	Kolodiej SJ et at. (1996)	described (Coulter and Harris, 1983) using a 100:1 (w:w) ratio of 6E8 to
	-10 0- 1:00-	papain.
24	D'Cruz OJ et al. (1995)	The protein concentrations of dialyzed IgG and Fab fractions were
		determined spectrophotometrically with values of $E^{1\%} = 14.0$ and 14.8
		respectively (Coulter and Harris, 1983)
25	Agner AE et al. (1995)	Papain fragmentation of IgG produces an amino end Fab fragment that retains
		its antigen-binding capabilities, has low nonspecific binding, which does not
		crosslink to antigens and will not precipitate or clump antigen-antibody
		complexes (Coulter and Harris, 1983).
26	Porta C et al. (1994)	A method employing papain attached to beaded agarose (Sigma Chemical
		Co.) and adapted from the described by Coulter and Harris (1983) was used.
27	Kamihira M et al. (1994)	The Fab and Fc fragments were prepared according to the conventional
		method (10) using solid-phase papain and protein A column chromatography.
28	Otteson EW et al. (1994)	Fab fragments of mAb 439 were prepared by digestion with papain (24). The
		Fab and Fc fragments were separated on an immobilized protein A column
		(Pierce Chemical Co.) (25).
29	Zhang HF et al. (1993)	The protein concentrations of dialyzed IgG and Fab fractions were
2	Zaming III Crui. (1995)	determined spectophotometrically with values of $E^{1\%} = 14.0$ and 14.8
		respectively (Coulter and Harris, 1983)
30	Gilbert MS et al. (1992)	Total IgG was first purified using a protein A column (Pierce, Rockford, IL),
50	Officer Mis et al. (1992)	and the purified IgG was cleaved with papain (Coulter and Harris, 1983) to
		obtain Fab fragments.
31	Sutor GC et al. (1992)	Papain cleavage of rabbit anti-Id was performed according to Coulter and
31	Suloi GC et at. (1992)	Harris (23), with some modifications.
2.0	* T 1 (1000)	
32	Jons T et al. (1992)	F(ab) fragments were prepared by papain cleavage (Coulter and Harris,
		1983).
33	Mahanthappa K et al. (1992)	Fab fragments were generated by incubation of the
		purified antibodies with immobilized papain (Pierce
		Chemical) by the method of Coulter and Harris (1983)
		and again purified by protein A-Sepharose 4B chromatography.
34	Ruf W et al. (1991)	Fab fragments of the Mabswere produced by cleavage of the purified IgG
		with immobilized papain (29).
35	Ruf W et al. (1991)	Fab fragments of mAbs were produced by cleavage of purified IgG with
		immobilized papain (16)
36	Pikuleva IA et al. (1991)	The degree of modification was determined spectrophotometrically, using the
		molar extinction coefficientfor IgG [19].
37	Taylor FB et al. (1991)	Fab fragments of TF9-5B7 were prepared by Coulter at al. [19].
38	Rock P et al. (1991)	Fab fragments were prepared from rabbit polyclonal anti-Forssman
50		and anti-asialo-GM, IgG by the method of Coulter and Harris
		(1983) and dialyzed against 10 mM phosphate/ IO mM NaCl
		buffer, pH 7.4.
39	DI-D (1000)	
39	Rock P et al. (1990)	Fab fragments of IgG fractions were prepared by using established
		procedures (Coulter & Harris, 1983).

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References with Coulter et al. (1983) citations

Bessen D et al. (1989)			
Pikukeva IA et al. (1989)	40	Bessen D et al. (1990)	
fractioning with ammonium sulphate, with subsequent cellulose chromatography DB-32 [6]. A mixture of unpurified activated derivatives of hemin in methanol was added to a 0.3 ml (0.55 mg/ml) solution of IgG in 20mM phosphate buffer, plf 7.2, titrated until a required level with pH imidazol. The final concentration of methanol did not exceed 3%. Upon the completion of the reaction, which was conducted in the dark, IgG was precipitated with acidic acetone (0.1 ml HCl per 50 ml of acetone); the precipitate was then washed twice with acidic acetone, then with H2O. After that the precipitate was then washed twice with acidic acetone, then with H2O. After that the precipitate was then washed twice with acidic acetone, then with H2O. After that the precipitate was the washed twice with acidic acetone, then with H2O. After that the precipitate was then washed twice with acidic acetone, then with H2O. After that the precipitate was the washed twice with acidic acetone, then with H2O. After that the precipitate was the washed twice with acidic acetone, then with H2O. After that the precipitate was the under the precipitate was determined under the precipitate was the precipitate washed to the precipitate was the precipitate washed to the precipitate washe	L	PU 1 71 1 (1000)	
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6 M chlorhydrate guanide, pH 7.2, after with the absorption spectra were recorded. For calculations of the degree of modifications, the following values of molar absorption coefficients were used: for hemin ε ₃₀₀ 93 000 M ⁻¹ . cm ⁻¹ , ε ₃₀₀ 31.000 M ⁻¹ . cm ⁻¹ , ε ₁₀ to IgG E ⁻¹ ₃₀₀ 14 [7]. 42 Dromer F et al. (1989) Fab and Fe Tragments were prepared according to Coulter & Harris (1983) using immobilized papain (Pierce Chemical Co., Rockford, IL). 43 Turco J et al. (1989) IgG concentration was determined using the value E _{12730m} = 14.0. ²¹ Pab were prepared from this IgG fraction by papain digestion at 37C using 2% papain (Type IV, Sigma Chemical Co., St. Louis, MO), 4 mmol/L EDTA, and 20 mmol/L cysteine with gentle agitation (7). 45 Das A et al. (1989) Univalent antibody (Fab) was prepared from purified IgG according to the method of Coulter and Harris. Sigma Chemical Co., St. Louis, MO), 4 mmol/L EDTA, and 20 mmol/L cysteine with gentle agitation (7). 46 Guzov VM et al. (1989) The IgG concentration was determined spectrophotometrically, using the coefficient of extinction Aγ ₂₀₁₆ = 14.0 [10]. 47 Ketsary A et al. (1989) Monovalent fragments were generated using procedures described by their A279 (2). 48 Sakaguchi DS et al. (1989) Monovalent fragments were generated using procedures described by Coulter and Harris (1983). 49 Savenkova MI et al. (1989) Monovalent fragments were generated using procedures described by Coulter and Harris (1983). 50 Wessels MR et al. (1989) Tragment and the tropenous IFA for detection of free and bound antigens. For synthesis of the immunosorbents activated sephanzos is often used: Br.N-sepharose for immobilizing plane activate sphanzose is often used. Br.N-sepharose for immobilizing plane immobilizing second antibodies [11]. 51 Uggla CK et al. (1989) The 36 F(ab): fragment was obtained after papain cleavage and verified by sodium dodecyl sulphate (SDS) gel analysis [8]. 52 Liu et al. (1989) The 36 F(ab): fragment was obtained after papain cleavage and verified			
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58 Russell DG et al. (1986) Anti-gp63 IgG was purified by protein A Sepharose chromatography and was			
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References with Coulter et al. (1983) citations

		digested with immobilized papain (21)
59	Gawade S et al. (1985)	These fragments were prepared by papain digestion of IgG using immobilized
		Papain (8).
60	Mohanty JG et al. (1985)	According to the literature, polypeptide g corresponds to Fab fragments (7).
61	Fedinec AA et al. (1985)	Antibody F(ab) fragments: these fragments were prepared by papain digestion
		of IgG using immobilized papain (6).
62	Tseng J. et al. (1988)	Fab fragments of mAbs (IgG isotypes) and heterologous IgG were prepared
	_	by immobilized papain digestion (Coulter and Harris, 1983).

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